INCH-POUND
ATPD 2235
9 January 1998
SUPERSEDING
MIL-L-45779C(AT)
11 December 1984

PURCHASE DESCRIPTION

LOADER-TRANSPORTER, GUIDED MISSILE: XM501E2 AND XM501E3; PROCESSING FOR STORAGE AND SHIPMENT OF

This purchase description is approved for use by the U.S. Army Tank-automotive and Armaments Command, Department of the Army, and is available for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This purchase description covers the processing of Loader-Transporter, Guided Missile: XM501E2 and XM501E3, for storage and shipment.

1.2 Classification. Processing will be of the following levels of protection (see 6.1):

Level A - The degree of preservation and packing required for protection of material against the most severe conditions known or anticipated to be encountered during shipment, handling and storage (periodic care and preservation during storage required).

Level B - The degree of preservation and packing required for protection of material during known favorable conditions during shipment, handling and storage. (This level shall not be used for overseas open deck loading.)

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: U.S. Army Tank-automotive and Armaments Command, ATTN: AMSTA-TR-E/BLUE, Warren, MI 48090, by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document, or by letter.

AMSC N/A AREA PACK

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3 and 4 of this purchase description. This section does not include documents cited in other sections of this purchase description or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirement documents cited in sections 3 and 4 of this purchase description, whether or not they are listed.

2.2 Government documents.

2.2.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DoDISS) and supplement thereto, cited in the solicitation (see 6.2).

SPECIFICATIONS

FEDERAL

A-A-208	- Ink, Marking, Stencil, Opaque (Porous and Non-Porous Surfaces).
A-A-374	- Sodium Bicarbonate, Technical.
A-A-1800	- Varnish, Oil: Spar.
A-A-52624	- Antifreeze, Multi-Engine Type.
O-S-801	- Sulfuric Acid, Electrolyte; for Storage Batteries.
TT-E-489	- Enamel, Alkyd, Gloss, (for Exterior and Interior Surfaces).
TT-E-529	- Enamel, Alkyd, Semigloss.
UU-T-81	- Tags, Shipping and Stock.
VV-L-800	- Lubricating Oil, General Purpose, Preservative (Water-Displacing, Low Temperature).
MMM-A-179	- Adhesive: Paper Label.
PPP-B-601	- Boxes, Wood, Cleated-Plywood.
PPP-B-621	- Boxes, Wood, Nailed and Lock-Corner.
PPP-B-1055	- Barrier Material, Waterproofed, Flexible.

DEPARTMENT OF DEFENSE

MIL-B-117	- Bag, Sleeve and Tubing Interior Packaging.
MIL-B-121	- Barrier Material, Greeseproofed, Waterproofed, Flexible.
MIL-C-450	- Coating Compound, Bituminous Solvent Type, Black (for Ammunition).
MIL-G-3056	- Gasoline, Automotive, Combat.
MIL-PRF-10924	- Grease, Automotive and Artillery.
MIL-V-13811	- Varnish, Waterproofing, Electrical, Ignition.
MIL-PRF-16173	- Corrosion Preventive Compound, Solvent Cutback, Cold-Application.
MIL-L-21260	- Lubricating Oil, Internal Combustion Engine, Preservative and Break-in.
MIL-B-22191	- Barrier Materials, Transparent, Flexible, Heat Sealable.
MIL-T-37402	- Tester, Antifreeze Solutions.
MIL-P-46002	- Preservative Oil, Contact and Volatile Corrosion Inhibited.
MIL-A-53009	- Additive, Antifreeze Extender, Liquid Cooling System.

STANDARDS

FEDERAL

FED-STD-141	- Paint, Varnish, Lacquer and Related Materials, Methods of Inspection, Sampling and Testing.

DEPARTMENT OF DEFENSE

MIL-STD-129	- Marking for Shipment and Storage.
MIL-STD-2073-1	- Military Marking, Standard Practice for.

(Unless otherwise indicated, copies of the above specifications, standards, and handbooks are available from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

2.2.2 Other Government documents, drawings, and publications. The following other Government documents, drawings, and publications form a part of this document to the extent specified herein. Unless otherwise specified, the issues are those cited in the solicitation.

PUBLICATIONS

PACKAGING DATA SHEETS

MS-35000-1 - Battery, Dry Charge Storage, Type 2HN.

PURCHASE DESCRIPTIONS

ATPD 2241 - Vehicles, Wheeled: Preparation for Storage and Shipment of.

(Copies of publications and purchase descriptions are available from the U.S. Army Tank-automotive and Armaments Command, ATTN: AMSTA-TR-E/BLUE, Warren, MI 48397-5000.)

2.3 Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DoD adopted are those listed in the issue of the DoDISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DoDISS are the issues of the documents cited in the solicitation (see 6.2).

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D287 - API Gravity of Crude Petroleum and Petroleum Products (Hydrometer Method) (DoD Adopted).
ASTM D3953 - Standard Specification for Strapping, Flat Steel and Seals (DoD Adopted).
ASTM D5330 - Standard Specification for Pressure-Sensitive Tape for Packaging, Filament Performed (DoD Adopted).
ASTM D5486 - Standard Specification for Pressure-Sensitive Tape for Packaging, Box Closure and Sealing (DoD Adopted).

(Application for copies should be addressed to American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.)

ASSOCIATION OF AMERICAN RAILROADS PUBLICATIONS

Section No. 1 - General Rules Governing Loading of Commodities on Open Top Cars.
Section No. 6 - Rules Governing the Loading of Department of Defense Material on Open Top Cars.

(Application for copies should be addressed to the Association of American Railroads, 59 East Van Buren, Chicago, IL 60605.)

DEPARTMENT OF TRANSPORTATION

Hazardous Materials Regulations.

(Application for copies should be addressed to the Department of Transportation, Hazardous Materials Regulation Board, Washington, DC 20590.)

INTERSTATE COMMERCE COMMISSION

Motor Carrier Safety Regulations.

(Application for copies should be addressed to the Interstate Commerce Commission, Bureau of Motor Carriers, Washington, DC 20590.)

2.3 Order of precedence. In the event of a conflict between the text of this purchase description and the references cited herein, the text of this purchase description shall take precedence.

3. REQUIREMENTS

3.1 First article. Unless otherwise specified (see 6.1), one of the first 10 production processed vehicles shall be subjected to the inspection specified in 4.2. Approval of this vehicle shall not relieve the contractor of his obligation to process all vehicles in accordance with this purchase description. Unless otherwise specified by the Government, any change to materials or design after approval shall require additional vehicles to be inspected as specified in 4.2. The Government representative shall select the vehicle to be inspected.

3.2 Materials. Materials shall be as specified herein and in referenced specifications and standards. Materials shall be free of defects which affect performance or serviceability.

3.3 Processing levels. Level A processing shall be as specified in 3.4. Level B processing shall be as specified in 3.5.

3.4 Level A.

3.4.1 Preparation prior to processing. Except as otherwise specified herein, and to the maximum extent consistent with production efficiency, economy, and safe storage and shipment, the vehicle shall be prepared for storage and shipment in a completely assembled condition after

test runs and completion and approval of all necessary repairs. Specified equipment shall be installed and all adjustments made so that the vehicle may be operated, shipped, and placed into service with a minimum of delay.

3.4.1.1 Processing records. Records of vehicle processing shall be maintained and shall be readily available for review by the Government representative.

3.4.2 Cleaning and drying. The vehicle shall be cleaned in accordance with cleaning and drying sections of MIL-STD-2073-1 and shall be dried by any applicable procedure specified therein. When necessary, a mild detergent shall be used, followed by a complete rinsing with clear water and then thoroughly dried. Cleaning shall be accomplished without directing steam or water jet above the fenders.

3.4.2.1 Backrests and seats. Installed backrests and cushioned components of seats shall be washed with a solution of soap and water, rinsed with clear water, dried, and immediately packaged (see 3.4.20).

3.4.2.2 Battery supports and retainers. Metal battery supports and retainers shall be cleaned with a solution composed of 1/2-pound of sodium bicarbonate, conforming to A-A-374, per gallon of water, and shall be flushed with clear water and dried. Battery supports and retainers shall be coated with compound conforming to MIL-C-450.

3.4.2.3 Primary fuel filter sediment bowl. With the exception of new manufactured vehicles, the primary fuel filter sediment bowl shall be disconnected from the fuel line, cleaned in accordance with MIL-STD-2073-1 and dried by any applicable procedure specified therein, and then reconnected.

3.4.3 Disassembly. Disassembly shall be accomplished only as necessary to safeguard parts from damage, pilferage and to provide required reduction in cubic volume. Removed bolts, nuts, screws, pins and washers shall be placed in one of the mating parts and secured. Other removed parts shall be preserved, packaged and packed. Packed parts shall be identified and stowed securely within the vehicle. For overseas shipment or when cube reduction is required to facilitate loading a greater number of vehicles on the transportation carrier, the vehicle shall be disassembled for shipment as shown in figures 1 and 1A.

3.4.3.1 Matchmarking. Parts removed from the vehicle shall be matchmarked when necessary to facilitate reassembly. Matchmarking information shall be put on cloth shipping tags conforming to type A of UU-T-81 or on metal tags marked with soluble paint, and attached to mating parts. The marked cloth shipping tags shall be waterproofed with varnish conforming to A-A-1800 or adhesive conforming to MMM-A-179.

3.4.4 Relubrication. When the vehicle has been operated in excess of 50 miles since the previous lubrication, or after cleaning with detergent or steam cleaning, the vehicle shall be lubricated using materials in accordance with drawings, specifications or lubrication order pertinent to the vehicle. All exposed oil-can points such as levers, locking bars, wing nuts, latches, hand-operated locking knobs, linkage, bar strikers, hinges, hinge pins, locking pins, pintle pins, locking levers, and threaded ends of yokes and related clevis pins, and all driver's seat rotating surfaces shall be lubricated with lubricating oil conforming to VV-L-800. Excess lubricating material shall be removed after the lubrication.

3.4.5 Transmission, transfer assembly, controlled differential, and final drives. The transmission shall contain lubricating oil conforming to type I, grade 10 of MIL-L-21260 filled to operating level. The transfer assembly, controlled differential, and final drives shall contain lubricating oil conforming to type I, grade 10 or 30, as applicable, of MIL-L-21260 filled to operating level. DD Form 1397 shall be annotated with the type and grade of lubricant used.

3.4.6 Engine crankcase. The engine crankcase shall be filled to operating level with lubricating oil conforming to type I of MIL-L-21260 of the seasonal grade specified in the applicable drawing, specification, or lubrication order. DD Form 1397 shall be annotated with the type and grade of lubricant used.

3.4.7 Engine preservation. The engine shall be processed in accordance with 3.4.7.1 and 3.4.7.2 in an uninterrupted sequence, except for the cooling period.

3.4.7.1 Preservation through fuel system. An auxiliary fuel container, with two compartments and a fuel line, positioned to provide gravity feed (see figure 2), shall have one compartment filled with lubricating oil conforming to type I, grade 10 of MIL-L-21260, and the other compartment filled with gasoline conforming to MIL-G-3056 with one quart of lubricating oil conforming to type I, grade 10 of MIL-L-21260 to each five gallons of gasoline. The fuel line shall be disconnected at the most convenient point nearest the vehicle fuel tank. The line from the auxiliary fuel container shall be connected to the fuel-to-engine line at the point of quick disconnect coupling. The container selector valve shall be turned to the "fuel" position. The engine shall be started and operated at 1200 revolutions per minute (rpm), without load, until running smoothly, but for not more than four minutes, then accelerated to 2/3 maximum rpm and with the engine still operating, the container regulator valve shall be turned to the "oil" position. At the instant the engine begins to misfire, the ignition switch shall be turned off. The line from the auxiliary fuel container shall be disconnected and the vehicle fuel line reconnected. Fuel filters shall be drained.

3.4.7.2 Preservation through spark plug openings. After the preservation specified in 3.4.7.1, the engine shall be cooled until the cylinder head temperature does not exceed 100 degrees Fahrenheit (°F), measured at the spark plug gasket surface of all cylinders. The

cooling shall be accomplished by forced air currents, by circulating of engine coolant, or by waiting the period of time necessary. When the ambient temperature exceeds 100°F, the engine shall be cooled to ambient temperature. Spark plugs shall be removed. While the engine is being turned over with the starting motor, one ounce of lubricating oil conforming to type I, grade 10 of MIL-L-21260 shall be atomized sprayed through each spark plug opening to assure complete coverage of all surfaces within the combustion chamber. One additional ounce of the same lubricating oil shall be atomized sprayed into each cylinder without cranking. Threads of spark plug openings shall be coated with lubricating oil conforming to type I, grade 10 of MIL-L-21260. Spark plugs shall be reinstalled and tightened to required torque. New gaskets shall be used when installing spark plugs. A red warning tag, bearing the information "ENGINE PRESERVED FOR STORAGE; DO NOT CRANK", shall be securely attached in a conspicuous location on the instrument panel. DD Form 1397 shall be annotated with the type and grade of lubricating oil used.

3.4.8 Fuel tank. The fuel tank shall be completely drained of all fuel by removing the drain plug. After draining, the drain plug shall be reinstalled and the fuel tank filled with lubricating oil conforming to type I, grade 10 of MIL-L-21260 and again drained. The fuel tank shall be allowed to stand with the drain plug removed until the oil flow ceases. The drain plug shall then be reinstalled. The fuel tank cap and filter screen shall be removed, coated with lubricating oil conforming to MIL-L-21260, and then reinstalled. Examination of the first processed fuel tank shall be made to determine if all interior surfaces are coated with preservative. If the top of the fuel tank is not coated with preservative because of an air lock, the sending unit shall be loosened or some other means devised to permit the preservative to reach all interior surfaces. Drained preservative oil may be used for processing other fuel tanks, provided not more than 10 percent of the fluid is fuel when tested in accordance with paragraph 4.5.2.3.

3.4.9 Cooling system. The cooling system shall be protected by one of the following procedures:

a. For shipment and storage in areas where the temperature drops below -40°F, cooling systems shall be protected as specified in 3.4.9.1.
b. For shipment and storage within the bounds of 30 degrees north latitude and 20 degrees south latitude, except the continental United States, cooling systems shall be protected as specified in 3.4.9.2.
c. For all other shipments, cooling systems shall be protected as specified in 3.4.9.3.

NOTE: DD Form 1397 shall be completed to indicate the coolant used.

3.4.9.1 Antifreeze compound procedure. The cooling system shall be filled to operating level with antifreeze compound conforming to A-A-52624. The compound shall be used without dilution. A warning tag, bearing the information "COOLING SYSTEM FILLED WITH

ANTIFREEZE (ARTIC-TYPE) - DO NOT DRAIN", shall be securely attached to the radiator filler neck.

3.4.9.2 Water and corrosion inhibitor procedure. The cooling system shall be filled with clear water up to the radiator upper tank. A corrosion inhibitor conforming the MIL-A-53009 shall be added in the proportion of 5 ounces of the inhibitor for each 10 quarts of water. The inhibitor shall be dissolved in 2 quarts of warm water and poured into the radiator while the engine is idling. More water shall be added if necessary, to fill the radiator to operating level. A warning tag, bearing the information "COOLING SYSTEM DOES NOT CONTAIN ANTIFREEZE - FILLED WITH WATER AND INHIBITOR", shall be securely attached to the radiator filler neck.

3.4.9.3 Water and antifreeze procedure. The cooling system shall be filled to operating level with a clean solution consisting of equal parts by volume of antifreeze (ethylene glycol) conforming to A-A-52624 and water. The engine shall be operated until a temperature has been reached that causes the thermostat to open to assure complete mixing and even distribution of the antifreeze solution. A warning tag, bearing the information "COOLING SYSTEM FILLED WITH WATER AND ANTIFREEZE SOLUTION (ETHYLENE GLYCOL) IN EQUAL PARTS BY VOLUME - DO NOT DRAIN", shall be securely attached to the radiator filler neck.

3.4.10 Dry charged batteries and cables. Dry charged batteries shall be installed in the vehicle battery carrier. Filler cap openings shall be sealed by placing a 2-inch wide by 3-mil thick piece of film conforming to type II of MIL-B-22191 over all filler cap openings with caps removed. The film shall be of sufficient length to allow the film to be depressed into the filler cap opening to the same depth as the filler cap. Filler caps shall be screwed into the filler openings to form a complete seal without damaging the film. Battery cables shall be secured to the battery carrier with 3/4-inch wide tape conforming to type IV of ASTM D5330.

3.4.10.1 Electrolyte. Electrolyte shall be packaged, packed, and marked as specified in O-S-801, except that exterior containers shall conform to PPP-B-601 or PPP-B-621. The packed electrolyte shall be stowed with the Basic Issue Items (BII) and secured independently to permit separate removal.

3.4.11 Air cleaner. The air cleaner shall be filled to the operating level with operational oil as specified in the applicable drawing, specification or lubrication order. The interior of the air cleaner, above the oil level, shall be sprayed with preservative oil conforming to grade I of MIL-P-46002 and the element reinstalled. Air cleaner openings shall be sealed with tape conforming to type IV of ASTM D5486.

3.4.11.1 Air intake. The air intake tube at the outlet side of the air cleaner shall be disconnected and one ounce of preservative oil conforming to grade I of MIL-P-46002 shall be atomized sprayed into the intake openings directed toward the engine. The air intake tube shall then be reconnected.

3.4.12 Exhaust systems. One ounce preservative oil conforming to grade I of MIL-P-46002 for each two feet of length shall be atomized sprayed into exhaust pipes or tailpipes toward the engine. Unpainted, exterior surfaces of the exhaust system, except the manifold, shall be coated with preservative conforming to grade 4 of MIL-PRF-16173. Openings of tailpipes shall be sealed with tape conforming to type IV of ASTM D5486.

3.4.13 Crankcase openings. Six ounces of preservative oil conforming to grade I of MIL-P-46002 shall be atomized sprayed into the crankcase through the dipstick shroud opening breather vent tube, breather vent, or oil filler tube, whichever is most accessible. A flexible extension of sufficient length shall be used to allow the spraying nozzle to be within the crankcase. The spraying nozzle shall not be submerged in the crankcase oil.

3.4.14 Engine sealing. All openings to the interior of the engine, such as the crankcase breather, oil filler caps, valve cover breather holes and oil level dipstick tube, shall be sealed with tape conforming to type IV of ASTM D5486. A warning tag, bearing the information “ENGINE PRESERVED, AIR CLEANER, TAILPIPE, CRANKCASE BREATHER, VALVE COVER VENTS AND OIL LEVEL DIPSTICK SEALED - REMOVE SEALS BEFORE STARTING ENGINE”, shall be secured in a conspicuous location on the instrument panel.

3.4.15 Hydraulic system. Prior to the engine preservation (see 3.4.7), the hydraulic system, including the hydraulic reservoir, shall contain lubricant in accordance with the applicable drawings, specifications or lubricating order, filled to operating level. The system shall be operated through three complete cycles. (NOTE: One cycle is defined as the operation of the superstructure through its full range of travel by actuation of the superstructure azimuth, elevation, roll and extension control levers.)

3.4.15.1 Hydraulic valves and lines. Unpainted, exterior metal surfaces of valves and lines shall be sprayed with varnish conforming to MIL-V-13811.

3.4.15.2 Hydraulic pistons. Each piston shall be fully extended and unpainted, machined metal surfaces shall be coated with grease conforming to MIL-PRF-10924. The piston shall then be returned to the normal position. Exposed, machined and greased coated surfaces shall be covered with barrier material conforming to type II, class 2, grade A of MIL-B-121 and overwrapped with barrier material conforming to class E-1 or L-4 of PP-B-1055. The overwrap shall be secured in place and sealed with tape conforming to type IV of ASTM D5486.

3.4.15.3 Hydraulic console. All exterior openings of the console covers shall be covered with barrier material conforming to class E-1 or L-4 or PPP-B-1055, sealed with tape conforming to type IV of ASTM D5486.

3.4.16 Drain valves. All floor drain valves shall be secured in the open position.

3.4.17 Electrical harnesses, wiring, junction boxes, and limit switches. All exterior electrical components shall be sprayed with varnish conforming to MIL-V-13811.

3.4.18 Instrument panel. The instrument panel shall be covered with barrier material conforming to class E-1 or L-4 of PPP-B-1055, sealed with tape conforming to type IV of ASTM D5486. Only the top and sides of the instrument panel shall be taped.

3.4.19 Driveshaft. The driveshaft shall be disconnected by removing the cross and bearing assembly located between the driveshaft output yoke and input yoke assembly (see figures 3 and 3A). The cross and bearing assembly and related hardware or parts shall be coated with grease conforming to MIL-PRF-10924 and packaged in accordance with MIL-STD-2073-1. The cross and bearing assembly and attached hardware shall be overwrapped in barrier material conforming to type II, class 2 of MIL-B-121 prior to placement in the unit container. All bare metal surfaces of the differential yoke, drive shafts including splines, and universal joints shall be coated with grease conforming to MIL-PRF-10924, then covered with barrier material conforming to type II, grade A, class 2 of MIL-B-121. The barrier material shall be secured with tape conforming to type IV of ASTM D5486. The drive shaft shall be secured in a position that will assure no contact with the differential yoke. Caution tags, similar to the one shown on figure 4, shall be attached to the master switch, ignition switch, and starter lever or switch as shown on figures 5 and 5A.

3.4.20 Seat. The seat channels, roller, latch, and spring shall be coated with compound conforming to grade 4 of MIL-PRF-16173.

3.4.21 Miscellaneous preservation. Unless otherwise specified, all exposed, unpainted, unplated metal surfaces on the inside and outside of the vehicle, except tracks, shall be coated with preservative conforming to grade 4 of MIL-PRF-16173. All exterior openings of the engine compartment shall be covered with barrier material conforming to class E-1 or L-4 of PPP-B-1055, secured with tape conforming to type IV of ASTM D5486.

3.4.22 Ramps, crane attachment hardware hoist adapter and universal handling beam assembly. Unpainted or unplated surfaces of the ramps, crane attachment hardware hoist adapter and universal handling beam assembly shall be coated with grease conforming to MIL-PRF-10924, covered with barrier material conforming to type II, grade A, class 2, of MIL-B-121, then overwrapped with barrier material conforming to class E-1 or L-4 of

PPP-B-1055. The barrier material shall be secured with tape conforming to type IV of ASTM D5486. The cable and unpainted surfaces of the sheave assemblies shall be coated with preservative conforming to grade 1 of MIL-PRF-16173. The cable shall be wound into a coil not to exceed 18 inches in diameter. The coil shall then be covered with barrier material conforming to class E-1 or L-4 of PPP-B-1055. The sheave assemblies shall be wrapped individually in barrier material conforming to class E-1 or L-4 of PPP-B-1055. Secure all barrier material with tape conforming to type IV of ASTM D5486. The handling fixture cable and sheave assemblies shall be packaged and packed in accordance with MIL-STD-2073-1, then identified and stowed with the BII.

3.4.23 Fire extinguishers. Fire extinguishers shall have a minimum of 90 percent of rated full charge. All seals shall be intact. DA Form 253 shall be completed and securely attached to the extinguisher (see 6.2).

3.4.24 Basic Issue Items (BII). Except as otherwise specified (see 6.1), all spare parts, tools and equipment shall be packaged and packed in accordance with ATPD 2241 or other documents designated by the responsible agency. The pack shall be identified to the pertinent vehicle by serial number and, except during shipment, shall be stored inside buildings.

3.4.24.1 BII containers. BII containers shall be placed on the vehicle and each container shall be secured with 1 1/4-inch strapping conforming to type I, class B of ASTM D3953, blocked and braced to prevent movement in transit.

3.4.25 Record forms. Two copies of DD Form 1397 shall be provided and completed in accordance with TM 38-750. Information on forms shall include preservation accomplished and depreservation instructions. The Equipment Log Book Binder and one copy of DD-Form 1397 (see 6.3) shall be placed in a bag conforming to type 1, class B, style 2 of MIL-B-117, 6 mil. The bag shall be closed by heat sealing and securely attached in or on the vehicle. The other copy of DD Form 1397 shall be waterproofed with adhesive conforming to MMM-A-179 and securely attached in a conspicuous location on the exterior of the vehicle.

3.4.26 Marking. In addition to any special marking required in the contract or purchase order, the vehicles shall be marked in accordance with MIL-STD-129, with the exception that in lieu of the marking requirements for unpacked vehicles specified in MIL-STD-129, the following shall apply:

a. Preservation data marking shall be stenciled or printed on pressure sensitive labels (see 6.4) for CONUS and overseas shipments. Labels shall be 2 1/2-inches high and 20-inches wide. The following basic marking is required:

1. Packaging document number including (when applicable) the vehicle preservation data sheet and revision number, level and date of protection.
2. Gross weight, cube and outside dimensions.
3. Contractor's name or depot symbol.
4. When vehicles are processed in accordance with manufacturer's standard or deviation is made from the processing document, the mark "not processed for storage" shall appear in lieu of the level of processing.
5. Preservation data marking shall be 1/2-inch high and shall be spaced according to figure 6.
6. Labels for level A shipments, other than entirely printed, shall be waterproofed by coating the entire outer surface of the label with spar varnish conforming to A-A-1800.

b. Overseas address marking shall be printed or stenciled on separate pressure sensitive labels, 6-inches high and 20-inches wide. Marking shall be 3/4-inch high, shall be spaced according to figure 7, and shall be as specified in the shipping order. When space is not adequate to accommodate the complete address using 3/4-inch characters, marking size shall be reduced to 5/8-inch or 1/2-inch. Stenciling shall be waterproofed as in paragraph a(6) above.

c. Label sizes and schema shall be altered only when one or mare of the following conditions exist:

    1. If the 6- by 20-inch address label is not large enough to accommodate specified marking when using the minimum 1/2-inch lettering, the label size shall be increased as required.
    2. When unique configuration of the vehicle makes it impossible to find a suitable location for either or both of the labels of the prescribed dimensions, labels shall be altered as required to fit the available space. Labels shall be of appropriate size to accommodate the required stenciling.
    3. Prior to using labels varying in size form the prescribed examples, Government approval shall first be obtained (see 6.2).

d. CONUS shipments shall have one preservation data marking label for each vehicle; all overseas shipments shall have two preservation data marking labels and two address marking labels for each vehicles. The preservation data label shall be placed directly above the address label for all overseas shipments, with approximately one inch separating the two labels. When space does not permit placement as indicated, labels shall be placed adjacent to each other. When specific instructions are not available, labels shall be applied to the most clearly

visible smooth surface in one of the following locations, listed in order of preference:

1. CONUS shipments - One label shall be affixed to the front slope. When possible, labels shall be affixed to the vehicles at a height of not more than six feet or less than four feet.
2. Overseas shipment - One label set shall be affixed to the front surface as in d(l) and one label set on the best available smooth surface on the back or right side near the back of the vehicle.

e. Labels shall comply with the following:

1. Shall be white with black printing or stenciling.
2. Shall be capable of being stenciled with stencil ink conforming to A-A-208,enamel conforming to TT-E-489, and paint conforming to A-A-208.
3. Shall be capable of being waterproofed with spar varnish conforming to A-A-1800.
4. After exposure in accordance with method 6161 of FED-STD-141 for one year in Florida or the equivalent, labels shall be removable from painted metal surfaces without leaving adhesive residue or damaging the painted surfaces.

3.4.26.1 Lifting points. The mark “LIFT HERE” shall be stenciled adjacent to the lifting eyes with arrows pointing to the lifting eyes. The stenciling shall be in characters a minimum or 3/4-inch high using white enamel conforming to TT-E-529.

3.5 Level B. Vehicles shall be processed in the same manner as specified for level A, with the following exceptions.

3.5.1 Transfer case, transmission, controlled differential and final drives. The transfer case, transmission, controlled differential and final drives shall contain lubricant in accordance with the applicable drawings, specifications or lubrication order filled to operating level; except when the units contain lubricating oil conforming to MIL-L-21260, operating level shall be attained by the addition of the applicable grade of preservative oil. Operating lubricant and preservative oil shall not be mixed. DD Form 1397 shall be completed to indicate the grade of lubricant or preservative oil used.

3.5.2 Engine crankcase. The engine crankcase shall contain lubricant in accordance with the applicable drawings, specifications or lubrication order, or lubricating oil conforming to type I or MIL-L-21260, filled to operating level. Operating lubricant and preservative oil shall not be mixed. DD Form 1397 shall be completed to indicate the grade of lubricant or preservative oil used.

3.5.3 Fuel tank. Unless otherwise specified, vehicles shall be shipped without draining residual fuel from the fuel tanks.

3.6 Reprocessing engine after loading. If the engine is operated while loading or being moved to the loading area, the engine shall be reprocessed as specified in 3.4.7. An auxiliary fuel tank shall provide the fuel.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements (examination and tests) as specified herein. Except as otherwise specified in the contract or purchase order, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspection set forth in this specification where such inspections are deemed necessary to ensure supplies and services conform to prescribed requirements.

4.1.1 Inspection records. Contractor shall maintain records of all inspections performed and such records shall be readily available for review by the Government representative.

4.2 First article inspection. One of the first 10 production processed vehicles (see 3.1) shall be subjected to the inspections specified in 4.5.

4.3 Quality conformance inspection. Unless otherwise specified, all production vehicles shall be subjected to the inspections specified in 4.5.2 through 4.5.2.4.

4.4 Failure. Failure of one of the first 10, or any production vehicle, to conform to the applicable requirements of this specification shall be cause for rejection of the vehicles by the Government. No vehicles shall be accepted until objective evidence that the contractor has corrected the condition causing the rejection has been provided to, and approved by, the Government.

4.5 Methods of inspection.

4.5.1 Materials. Except for materials that have been inspected by the Government at source, all materials to be used in processing of vehicles shall be inspected in accordance with the applicable material specifications to determine conformance to 3.2; or certified inspection and laboratory test reports shall be provided which show that furnished materials conform to the applicable material specifications. When materials are listed on a Qualified Products List, they shall be obtained from one of the approved sources.

4.5.2 Processing. Vehicle processing shall be inspected to determine conformance to this specification. Inspection of processing shall include all requirements specified in table I and inspection 4.5.2.1 through 4.5.2.4.

TABLE I. Processing inspection.
(see indicated paragraphs for level A and level B requirements)

Item	Cleaning	Preservation		Packaging
	Levels A and B	Level Item A	Level B	Levels A and B
Preparation prior to processing				3.4.1
Processing records				3.4.1.1
Cleaning & drying	3.4.2			
Backrests & seats	3.4.2.1			
Battery supports & retainers	3.4.2.2			
Primary fuel filter sediment bowl	3.4.2.3			
Disassembly				3.4.3 & 3.6
Matchmarking				3.4.3.1
Relubrication		3.4.4	3.4.4	
*Transfer case, transmission, controlled differential, & final drives		3.4.5	3.5.1	
*Engine crankcase		3.4.6	3.5.2	
Engine preservation		3.4.9.3	3.4.9.3	
Preservation through fuel system		3.4.7	3.4.7	
*Preservation through spark plug openings		3.4.7.1 3.4.7.2	3.4.7.1 3.4.7.2	
Fuel tank		3.4.8	3.5.3	
*Cooling system		3.4.9	3.4.9	
Antifreeze compound procedure		3.4.9.1	3.4.9.1	
Water & corrosion inhibitor procedure		3.4.9.2	3.4.9.2	
Water & antifreeze procedure				

TABLE I. Processing inspection - Continued.
(see indicated paragraphs for level A and level B requirements)

Item	Cleaning	Preservation		Packaging
	Levels A and B	Level Item A	Level B	Levels A and B
Dry charged batteries & cables		3.4.10	3.4.10	
Electrolyte		3.4.10.1	3.4.10.1	3.4.10.1
Air cleaner		3.4.11	3.4.11	
Air intake preservation		3.4.11.1	3.4.11.1	
Exhaust preservation		3.4.12	3.4.12	
Crankcase openings		3.4.13	3.4.13	
Engine sealing		3.4.14	3.4.14	
Hydraulic system		3.4.15	3.4.15	
Hydraulic valves & lines		3.4.15.1	3.4.15.1	
Hydraulic pistons		3.4.15.2	3.4.15.2	
Hydraulic console		3.4.15.3	3.4.15.3	
Electrical harnesses, wiring, junction boxes, & limit switches		3.4.17	3.4.17	
Instrument panel		3.4.18	3.4.18	
Driveshaft		3.4.19	3.4.19	3.4.19
Seat		3.4.20	3.4.20	
Miscellaneous preservation		3.4.21	3.4.21	
Ramps, crane attachment hardware hoist adapter & universal handing beam assembly		3.4.22	3.4.22	3.4.22
Fire extinguishers				3.4.23
Basic Issue Items (BII)		3.4.24	3.4.24	3.4.24
BII containers				3.4.24.1
Record forms				3.4.25
Marking				3.4.26
Lifting points				3.4.26.1
Reprocessing engine after loading		3.6	3.6	

*NOTE: Inspect DD Form 1397

4.5.2.1 Cleaning. To determine conformance to 3.4.2, vehicles shall be examined for cleanliness, and one vehicle each day shall be tested for cleanliness in accordance with the applicable provisions of MIL-STD-2073-1. Surfaces to which tape is to be applied shall be examined for cleanliness before applying tape.

4.5.2.2 Fuel tank. To determine conformance to 3.4.8, the interior of the fuel tank shall be inspected to assure that complete processing, as specified has been accomplished.

4.5.2.3 Fuel and oil mixture test. The drained preservative oil from the fuel tanks of one out of five vehicles shall be tested to determine conformance to 3.4.8:

a. The American Petroleum Institute (API) gravity of the MIL-L-21260 oil as received and unused shall be determined by the contractor.
b. To nine parts of the new unused oil add one part of fuel. Fuel shall be to the same specification as is mixed in vehicles concerned. Materials shall be thoroughly mixed before testing.
c. An API hydrometer with thermometer, plus corrective values for temperature differential above or below the established base temperature, shall be used to determine a ten percent dilution. The resultant gravity value determined by this test shall then be used as the control for all oils used which have the same basic (unused oil) gravity. MIL-L-21260 oils of different API gravity shall not be mixed. The equipment and procedure for conducting the test shall be in accordance with ASTM D287.
d. A test specimen of one gallon of the drained preservative oil shall be tested with the hydrometer for a comparison of the purity points.

4.5.2.4 Cooling system. To determine conformance to 3.4.9, one vehicle from each days production shall be selected at random and the engine coolant shall be tested using a hydrometer-thermometer type tester conforming to MIL-T-37402, with a range of -60 to +160°F.

4.5.2.5 Engine. To determine conformance to 3.4.7.2, the interior of the engines form one of the first ten production processed vehicles shall be examined for surface coverage. Engines shall be disassembled to the extent necessary to permit visual examination of all surfaces within the combustion chamber. The combustion chamber is all surfaces within the cylinder from, and including, the crown of the piston to, and including, the crown of the piston to, and including, the surface of the head within the cylinder. All surfaces within the combustion chamber shall have a “wet” coating of preservative oil such as is obtained when an item is dipped or flushed with the oil. The processing method of the approved preserved engine shall be submitted in writing, for use in processing engines in all subsequent production vehicles.

5. PACKAGING

This section is not applicable to this specification.

6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Ordering data. Procurement documents should specify the following:

a. Title, number, and date of this specification.
b. Applicable level of processing (see 1.2).
c. If inspection of one of the first 10 production processed vehicles is not required (see 3.1).
d. Applicable procedure for protection of cooling system (see 3.4.9).
e. If BII should be processed, packed, packaged, or stored other than as specified (see 3.4.24).

6.2 Safety precautions. Caution should be exercised in handling CO_2 fire extinguisher cylinders. Cylinders should not be dropped, permitted to strike each other, or handled roughly. When reissued for servicing, extreme care should be exercised during the reinstallation operation to avoid tripping the fire extinguisher control system (see 3.4.23).

6.3 Forms. A copy of "The Equipment Log Book" and all required forms will be furnished to the contractor by the Government at least 30 days before shipment of the equipment as required by the contract delivery schedule (see 3.4.25).

6.4 Labels. The Fasson Products, "Fas Cal 5005 Vinyl"; National Delalcomania Corporation, "Mac Tac Film with MR-1 adhesive" have proven satisfactory for this application.

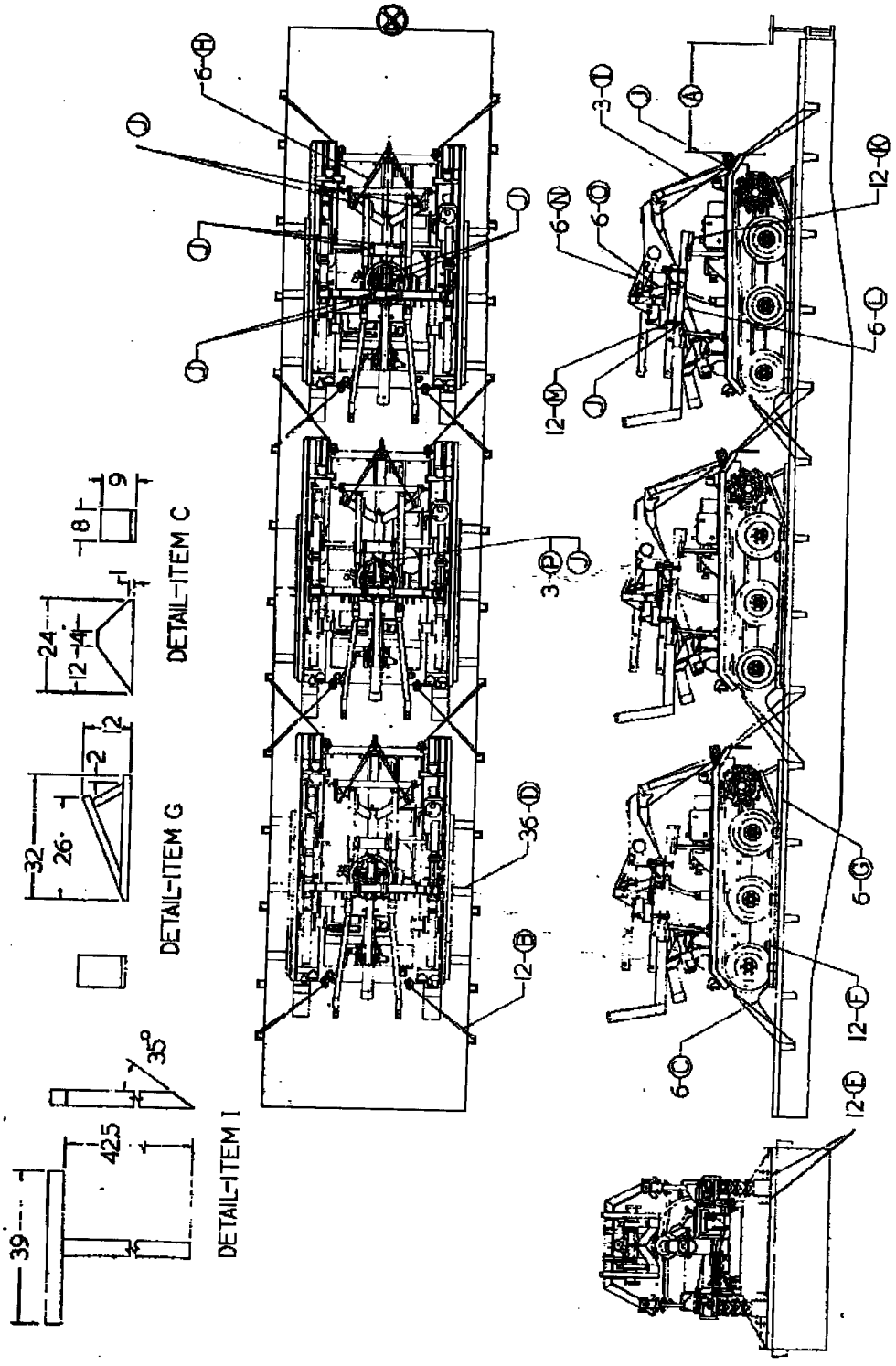


FIGURE 1. Tie-down for the XM501E2 and XM501E3 Guided Missle Loader- Transporters.

ITEM	NO. PCS. PER UNIT	
A		Brake wheel clearance. See figure 2 of Association of American Railroads Manual.
B	4	Each to consist of 3/8-inch wire rope, preformed, 6 by 19 improved plow steel, regular lay, 6.1 ton, Bethanized or equal. Each to form one continuous loop, with 12-inch overlap, secured by 3 cable clips and to be pretensioned by coffing hoist or other suitable means. Protect cables by providing a radius around sharp edges. Turnbuckles not allowed.
C	2	Blocks (see detail) to be located as shown in front of front wheel nailed in place with six 60-d nails.
D	12	Two pieces of 2-inch by 4-inch by 12-inch located at each wheel center. Secure lower piece to floor with five 20-d nails and top piece to lower place with five 30-d nails.
E	4	Consists of two pieces of 2-inch by 4-inch by 84-inch against each track, both inside and outside. Secure lower place to floor with 30-d nails spaced about 10-inches apart and top piece to lower piece in like manner.
F	4	2-inch by 4-inch by 15 5/8-inch. Locate as shown inside front and rear wheels and nail each to Items E with six 30-d nails.
G	2	Blocks (see detail) to be constructed of 3-inch by 10-inch or 2-inch by 12-inch. Locate as shown at rear of tracks and secure each to floor with eight 40-d nails.
H	2	1 1/4-inch by .035-inch high tension band. Each to be located, as shown, around boom and trailer hitch.
I	1	Boom support (see detail) to be 4-inch by 4-inch. Locate as shown.
J	AS REQUIRED	Suitable material such as waterproof paper and burlap. Locate at points shown.
K	4	2-inch by 4-inch by 6-inch. Locate as shown and secure each to items L with four 20-d nails.
L	2	Load-bearing members to be 4-inch by 4-inch by 6-inch. Locate on top of missile supports.
M	4	3/4-inch by .035-inch high tension band. Locate, 2 places, around each outer Hoisting Beam and Item L.
N	2	3/4-inch by .035-inch high tension band. Locate, 2 places, around Top Yoke Tube and Intermediate Link Assembly Tube, as shown.
O	2	3/4-inch by .035-inch high tension band. Locate, 2 places around Top Yoke Tube and Index Boom Assembly Shaft, as shown.
P	1	3/4-inch by .035-inch high tension band. Locate one piece around operator's protective device and Index Boom Assembly.

General: Rules Governing Loading of Commodities on Open Top Cars; Sections 1 and 6 of Association of American Railroads Manual.

FIGURE 1A. Material and tie-down arrangement for the XM501E2 and XM501E3 guided missile loader - transporters.

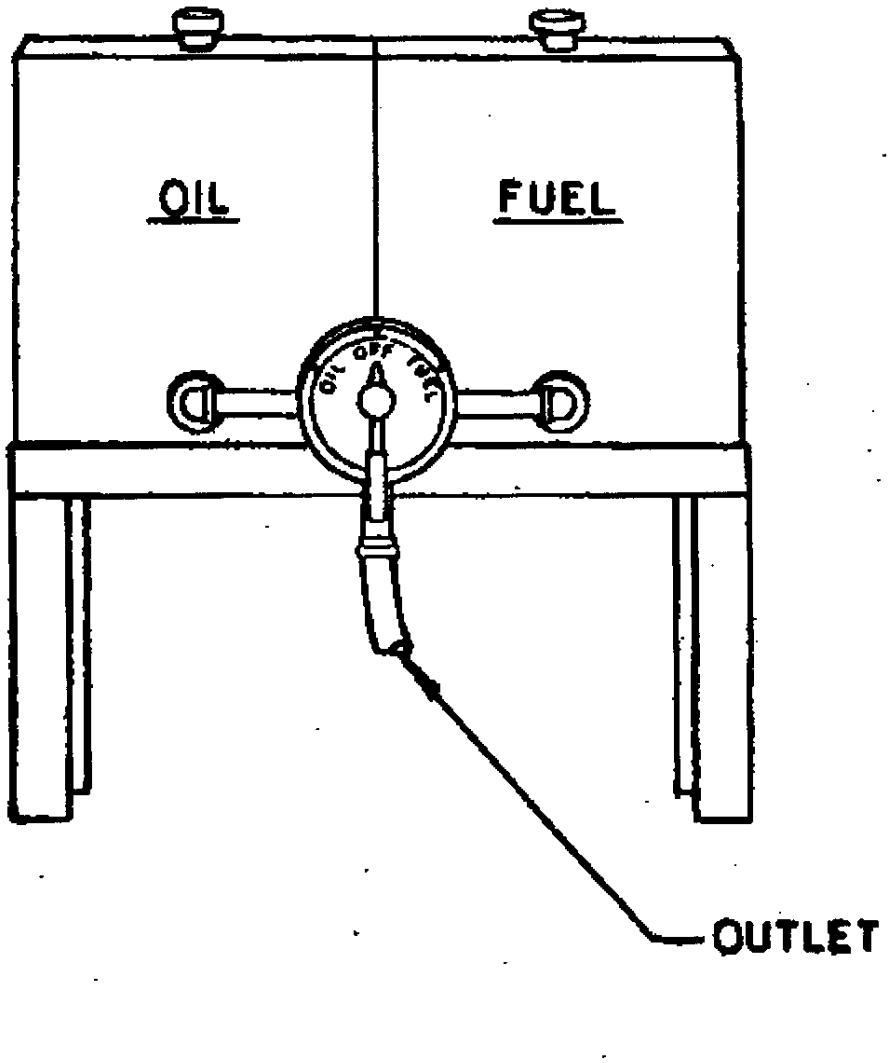


FIGURE 2. Frame supported container for the XM501E2 and XM501E3 guided missile loader - transporters.

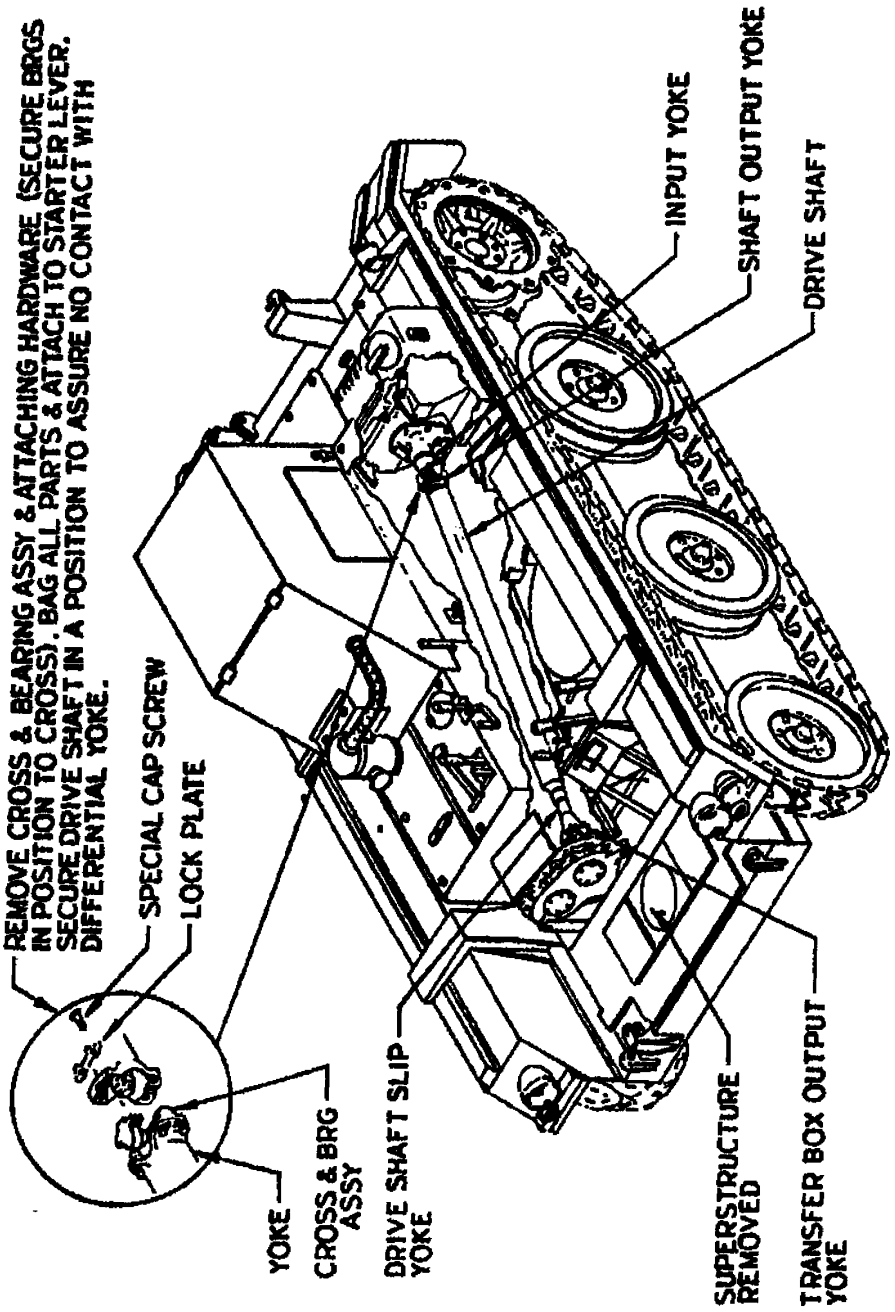


FIGURE 3. Drive train for the XM501E2 Guided Missle Loader - Transporter.

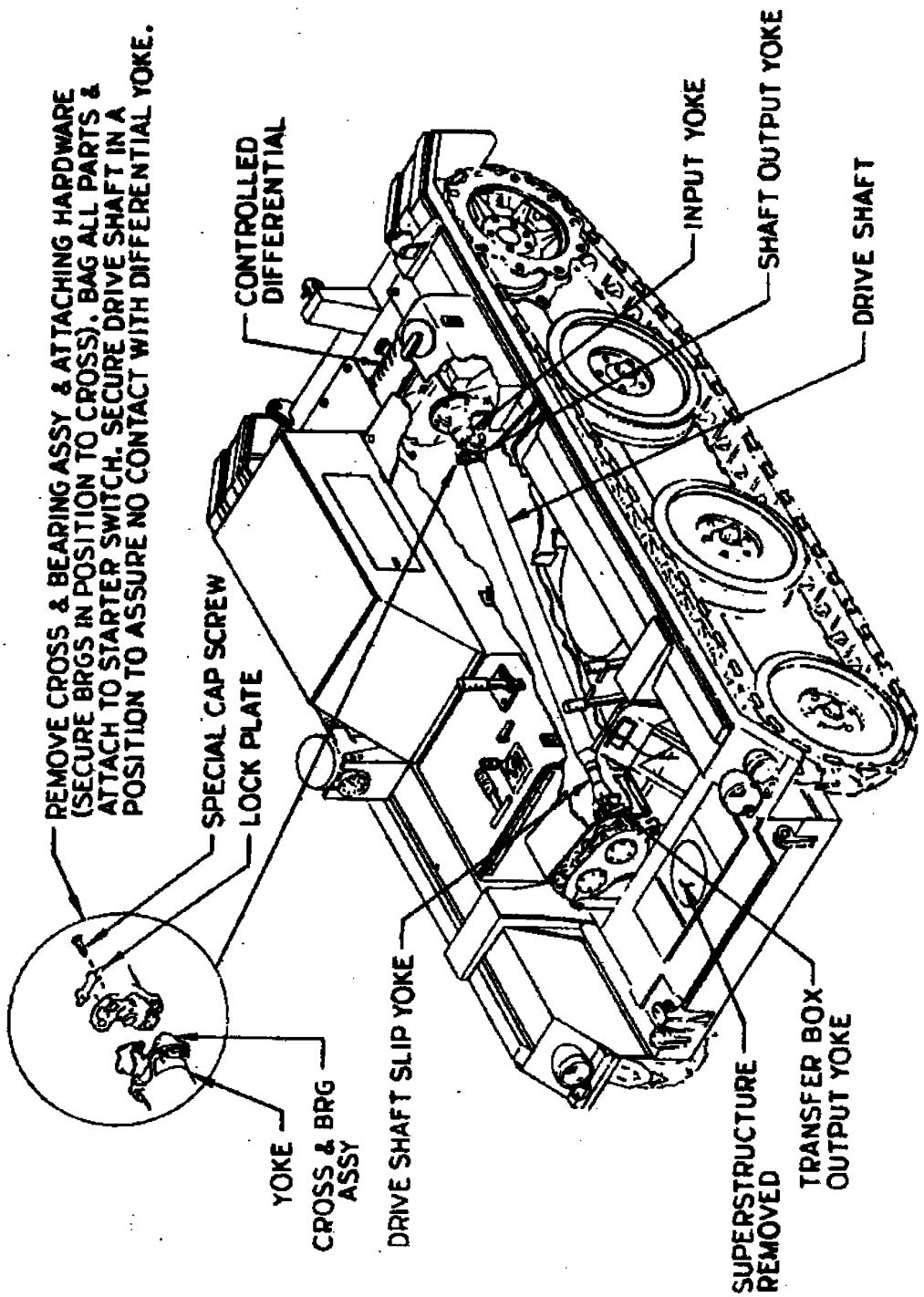
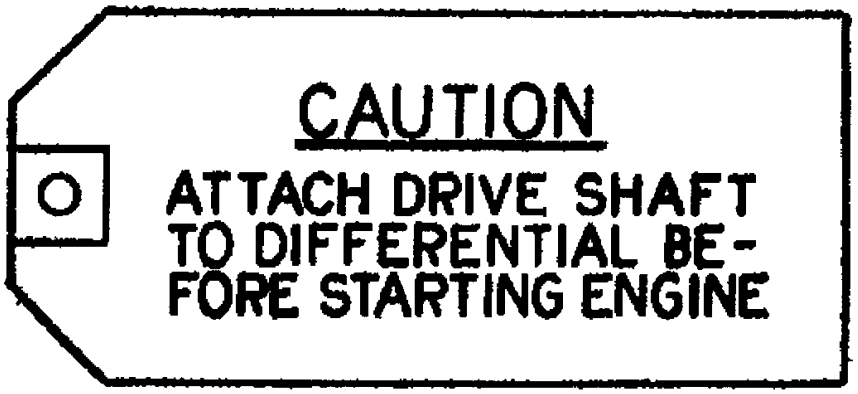


FIGURE 3A. Drive train for the XM501E3 Guided Missle Loader - Transporter.



NOTE: SEE FIGURES 5 AND 5A FOR APPLICATION.

FIGURE 4. Caution tag for the XM501E2 and XM501E3 Guided Missile Loader - Transporters.

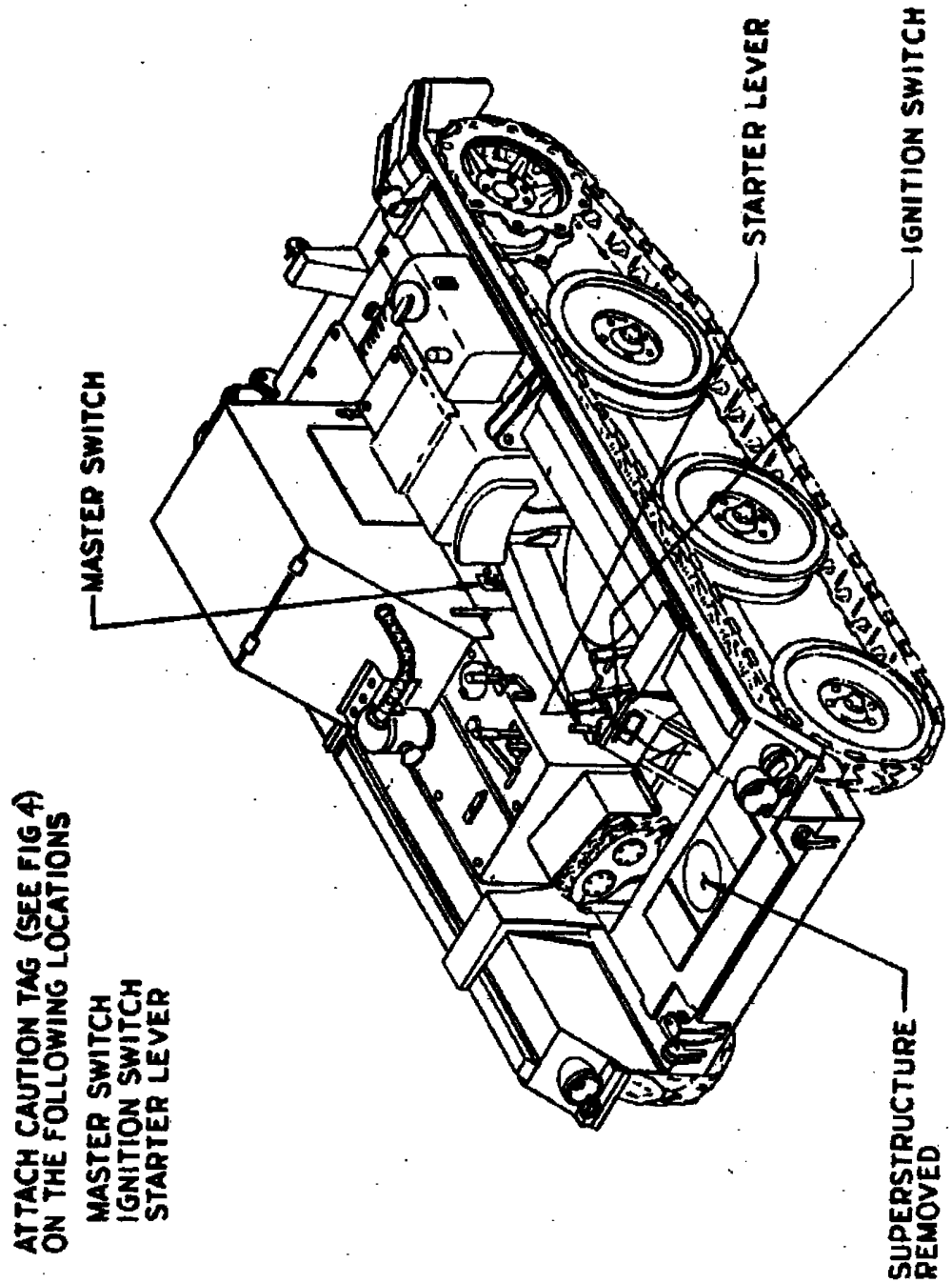


FIGURE 5. Caution tag locations for the XM501E2 Guided Missle Loader - Transporter.

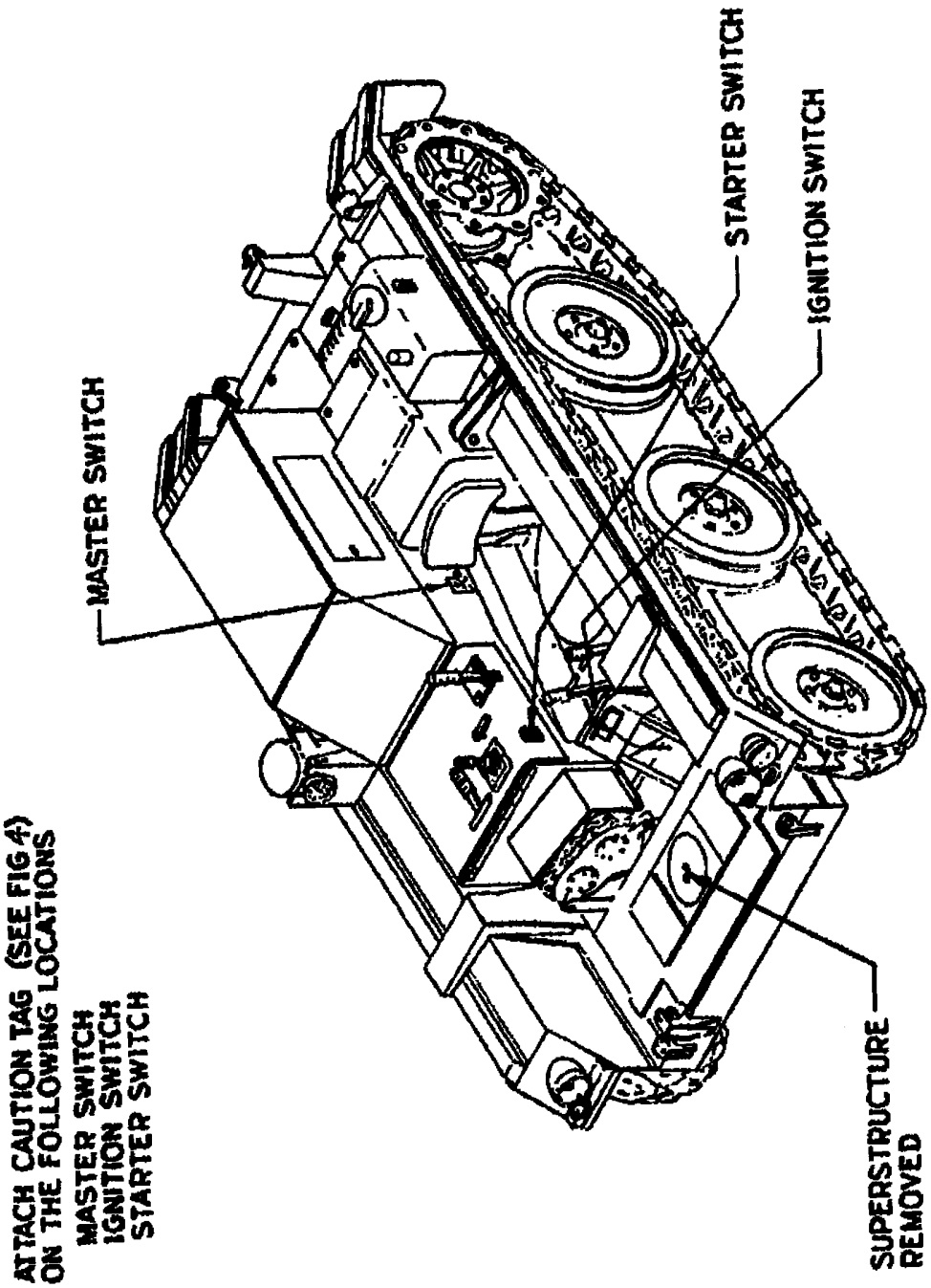


FIGURE 5A. Caution tag locations for the XM501E3 Guided Missle Loader - Transporter.

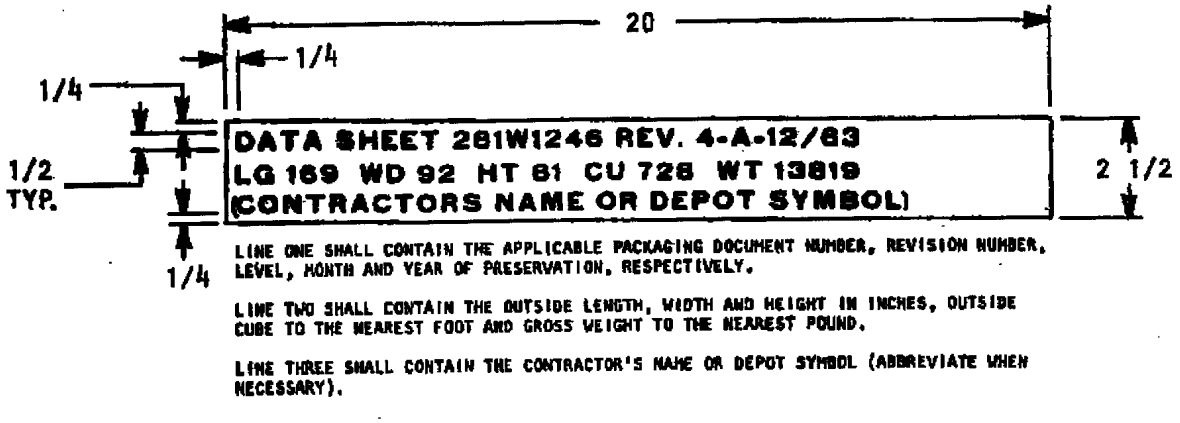


FIGURE 6. Example of preservation and data marking label.

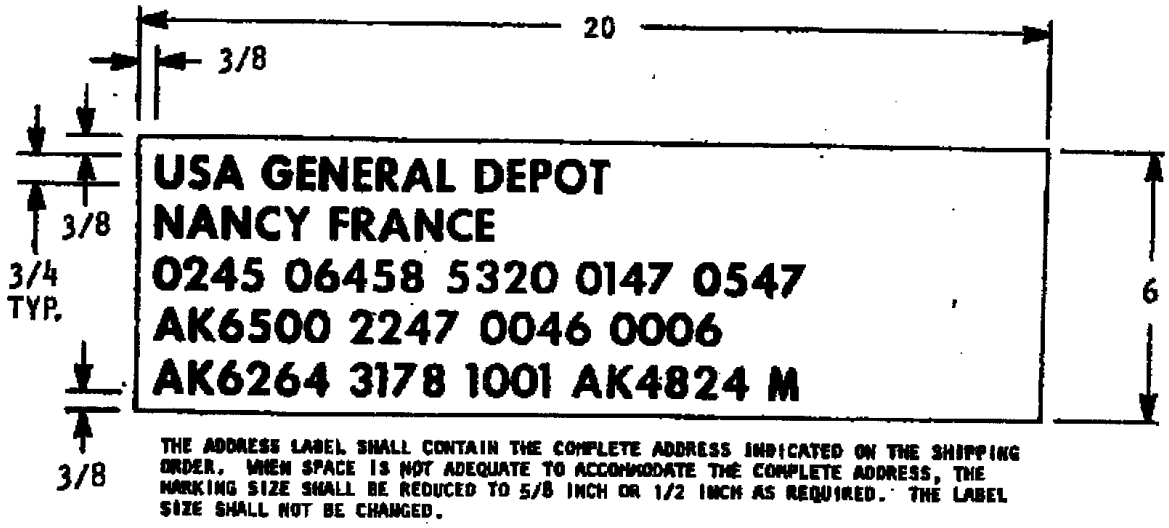


FIGURE 7. Example of address marking label.